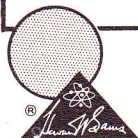


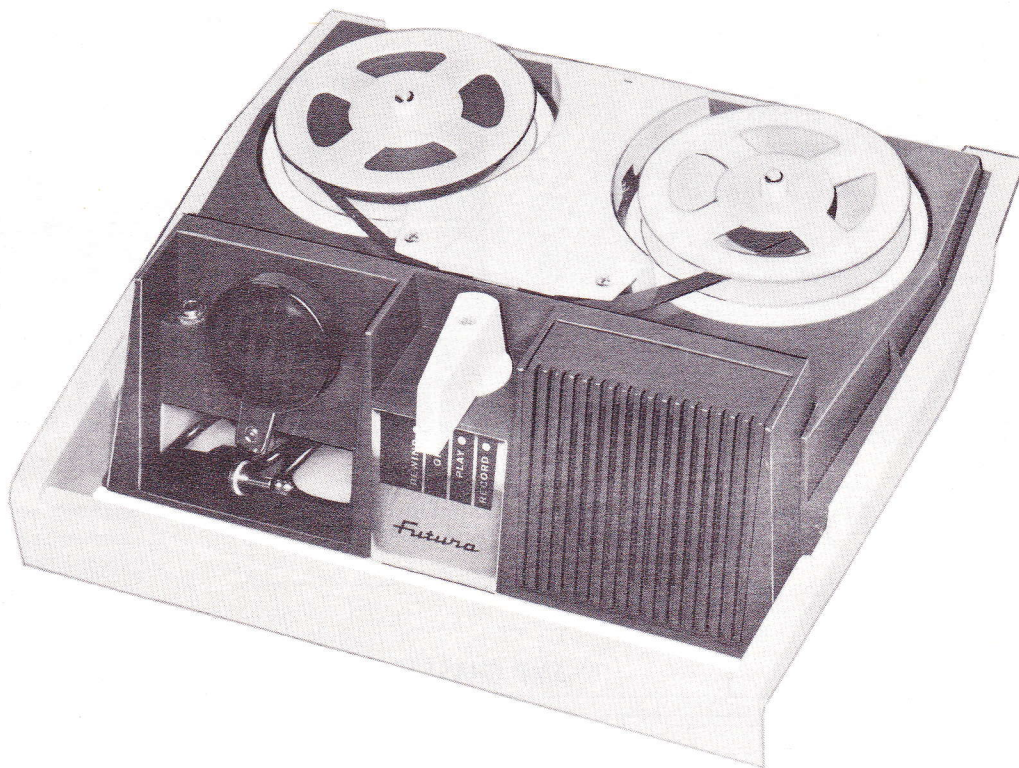
PHOTOFACT® Folder

with CIRCUITRACE®



**FUTURA
MODEL 400-499**

**FUTURA
MODEL 400-499**



**FUTURA
MODEL 400-499**

GENERAL INFORMATION

Futura Model 400-499 tape recorders, record and play back a single track of material on standard width recording tape at a tape speed of 3 3/4 ips.

Power is supplied by a self-contained 9-volt battery.

Supplied By:

Bell Products Company
4251 Forest Park Avenue
St. Louis 8, Missouri

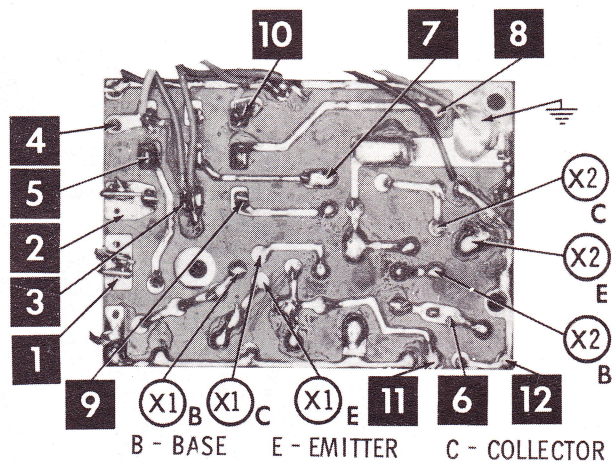
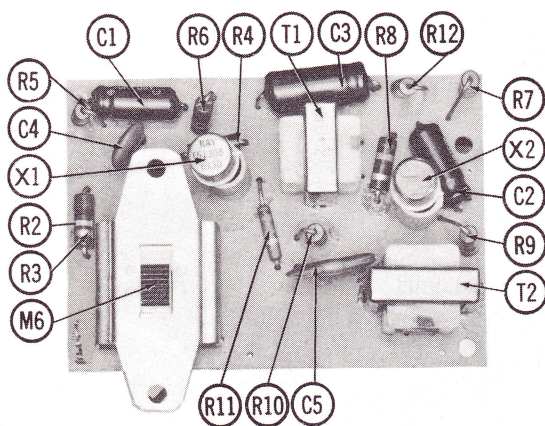
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement

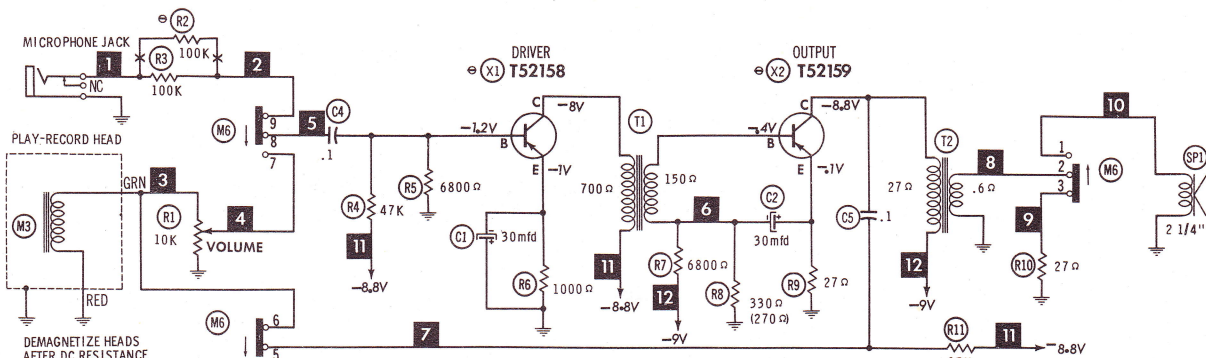
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Printed in U.S. of America

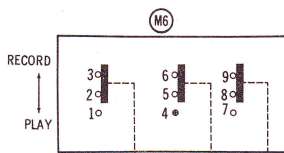


AMP CHASSIS

A Howard W. Sams **CIRCUITRACE** Photo

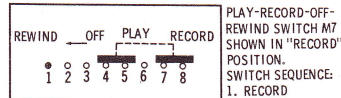


SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION



PLAY-RECORD SWITCH
SWITCH M6 SHOWN
IN "RECORD" POSITION.

LOCATING KEY
X1, X2
TERMINAL GUIDE



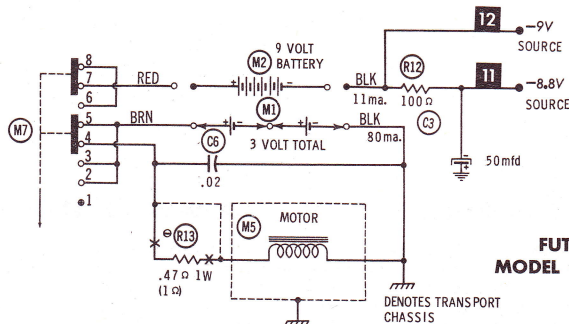
PLAY-RECORD-OFF-
REWIND SWITCH M7
SHOWN IN "RECORD"
POSITION.
SWITCH SEQUENCE:
1. RECORD
2. PLAY
3. OFF
4. REWIND

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of $\pm 15\%$ in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
A PHOTOFACIT STANDARD NOTATION SCHEMATIC
with **CIRCUITRACE**

©Howard W. Sams & Co., Inc. 1963



**FUTURA
MODEL 400-499**

DENOTES TRANSPORT
CHASSIS

FUNCTION OF CONTROLS

Action Lever

Four-position control which selects the Rewind, Off, Play and Record modes of operation. Power is

removed from the unit when in the "Off" position.

Volume Control

Adjusts volume for playback only.

OPERATING INSTRUCTIONS

Threading the Tape

1. Place a reel of tape on the left (supply) spindle and an empty reel on the right (take-up) spindle.
2. Unwind approximately 8 inches of tape from the left (supply) reel. Insert tape in front of tape guides between the head and the front of plastic control deck. Make sure dull side of tape faces rear of recorder.
3. Insert free end of tape into slot on the hub of the empty reel. Turn reel several times counter-clockwise until tape is secured to reel and all slack is taken up between reels.

To Record from Microphone

1. Remove Mic from its holder located to the lower left front of instrument and plug it into the Mic jack (M2) located above the Mic holder.
2. Turn the Action Lever to Record position. Hold the Mic about six inches from your mouth and talk in a normal voice. In the Record position the tape is automatically erased prior to any new recording.

To Rewind Tape

1. Turn the Action Lever to the Rewind position to

rewind the tape. Turn lever to the Off position to stop the tape.

To Play a Recording

1. Follow instructions under "Threading the Tape".
2. Move Action Lever to the Play position.
3. Adjust the Volume control to desired listening level.
4. To stop tape travel, move Action Lever to the Off position.

Erasing Recorded Material

Any material on the tape is automatically erased before a new recording is made. To erase a recording without new material, follow the normal recording procedure, but leave microphone disconnected.

To Edit and Splice Tape

Tape may be edited, and unwanted portions cut out and rejoined into another sequence. Cut tape at a slight diagonal, and join ends with splicing tape on the glossy side. Trim off excess width.

DISASSEMBLY INSTRUCTIONS

1. Remove the recorder top cover by depressing the sides slightly and lift. The cover will disengage from the hinge.
2. Remove tape reels.
3. Remove two Phillips-head screws securing plastic head cover and lift cover from its hinges.
4. To remove chassis (tape deck and amplifier)
5. Remove chassis from case.
6. To reassemble, reverse the foregoing procedure.

from case, remove the Phillips-head screw located in the center of the rear edge of plastic tape deck base. Also, remove two Phillips-head screws located on the bottom side of unit at the upper corners near the handle.

TROUBLE CHART

Symptom	Cause	Remedy
No drive on Record, Playback, or Rewind.	1. Dead motor batteries. 2. Spring (23) broken. 3. Defective motor (21)	1. Replace motor batteries. 2. Replace spring (23). 3. Replace motor (21).
Recorder speed too slow.	1. Weak motor batteries. 2. Oil or grease on pulley rubber sleeve.	1. Replace motor batteries. 2. Clean sleeves.
Does not Record.	1. Defective head (24). 2. Broken head leads.	1. Replace head (24). 2. Repair head leads.
Records intermittently.	1. Broken Magnet Holder spring (15).	1. Replace spring (15).

CLEANING

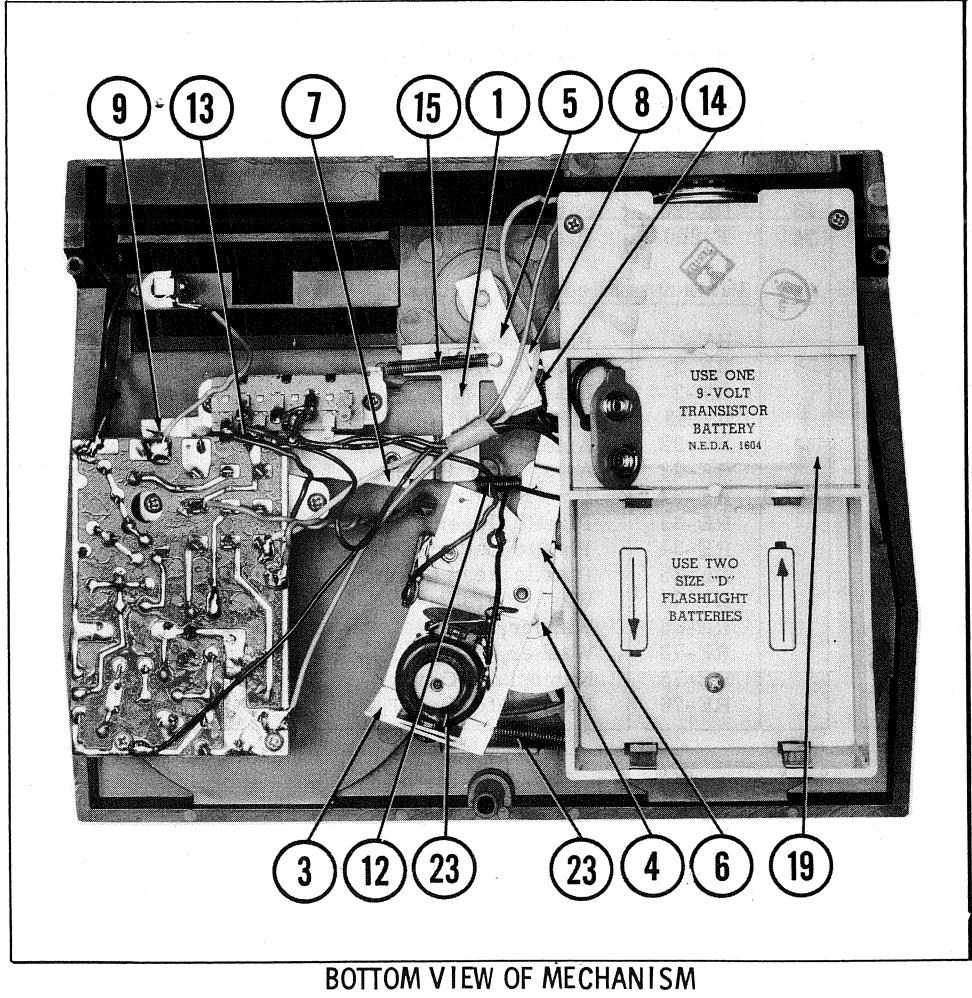
Tape guides (11) and recording head (28) may accumulate tape oxide coating, worn off the tape as it passes these parts. This accumulation will cause poor performance and should be removed with a soft, lint-free cloth, dipped in alcohol.

Clean Motor pulley, rubber sleeve, and Idler pulley rubber sleeve (12) with a soft, lint-free cloth, dipped in alcohol.

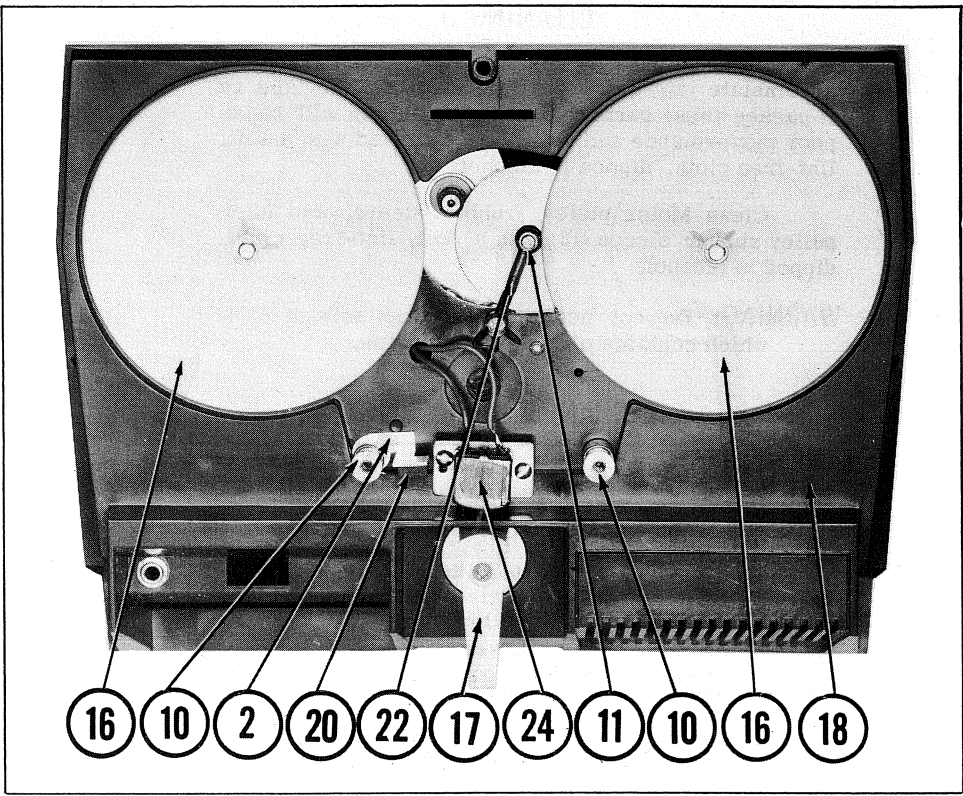
WARNING: Do not use any cleaning solvent which contains oil or Tetrachloride.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	RE-4	Switch Blade
2	RE-5	Magnet Holder
3	RE-6	Motor Drive Mount
4	RE-7	Idler Pulley Holder
5	RE-8	Main Lever
6	RE-9	Motor Mount Extension
7	RE-10	Switch Dog
8	RE-11	Index Cam
9	RE-12	Switch Dog Guide
10	RE-17	Tape Guide (2)
11	RE-18	Idler Pulley, with Rubber Sleeve
12	RE-24	Spring, Motor Mount Extension
13	RE-25	Spring, Switch Dog
14	RE-26	Spring, Index Cam
15	RE-27	Spring, Magnet Holder
16	RE-30	Turntable (2)
17	RE-31	Knob, Volume
18	RE-36	Plastic Control Deck
19	RE-37	Plastic Battery Box
20	RE-39	Erase Magnet
21	RE-54	Motor, with Pulley and Rubber Sleeve
22	RE-67	Spring, Idler Pulley
23	RE-83	Spring, Model Drive Mount
24	F-800	Play-Record Head
Parts not called out		
	RE-1	Pivot Bearing, Motor Drive
	RE-2	Pivot Bearing Shaft, Motor Drive
	RE-3	Index Pin
	RE-13	Motor Mount
	RE-22	Axle, Turntable
	RE-23	Axle, Idler Pulley
	RE-32	Plastic Case
	RE-33	Plastic Cover
	RE-34	Plastic Battery Door
	RE-35	Plastic Head Cover
	RE-64	Washer, Fiber
	RE-66	Washer, Felt
	RE-73	Washer, Steel
	RE-75	Nameplate (Cover)
	RE-76	Nameplate (Deck)



BOTTOM VIEW OF MECHANISM



TOP VIEW OF MECHANISM

AMP PARTS LIST AND DESCRIPTION

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
X1	TS2158	Driver	2N406	2N362	
X2	TS2052*		2N408	2N632	
	TS2159	Output			
	TS2053*				

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT.	REPLACEMENT DATA			
			AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	SPRAGUE PART No.
C1	30	6	FP30-6	NLW30-6	MTI-13	MLV30-6
C2	30	6	FP30-6	PTT27	NLW30-6	MLV30-6
C3	50	10	FP50-8	PTT45	NLW50-10	MLV50-10

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA			
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENDO PART No.
C4	.1			UK10-104	H-05P1	TG-P10
C5	.1			DA-104	H-05P1	TG-P10
C6	.02		BPD-02	DD-203	H-05S2	TG-S20

CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA			
			FUTURA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.
R1	Volume	10K	RE-89			NCL14A*

* Ignore Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN PART No.		IRC PART No.	WORKMAN PART No.	
R2	100K						
R3	100K						
R4	47K						
R5	68002						
R6	10002						
R7	68002						

Note 1. Not used in some versions.

* Alternate

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA			NOTES
		FUTURA PART No.	MERIT PART No.	STANCOR THORDARSON PART No.	
T1	1.5				
	SEC.				
	1				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA			NOTES
		FUTURA PART No.	Merit PART No.	Stancor THORDARSON PART No.	
T2	13702				
	PRI.				
	6-82				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		FUTURA PART No.	QUAM PART No.	
SPI	2 1/4" PM			
	FIELD V. C. IMP.			
	6-82			

BATTERIES

ITEM No.	VOLTAGE	FUTURA PART No.	REPLACEMENT DATA			NOTES
			BURGESS "A"	"B"	"B"	
M1	1.5V					
M2	9V					
			230	A100	M-13R	Motor Power
			206	216	M-1604	Amplifier Power

MISCELLANEOUS

ITEM No.	PART NAME	FUTURA PART No.	NOTES
M3	Head Magnet	F-800	
M4	Motor	RE-39	
M5	Switch	RE-54	
M6	Microphone	AM-2	
M7		RE-41	
		RE-57	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RE-31	Volume
Knob	RE-91	
Case	RE-32	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Power Cord	8524 (Stranded) Available in 12 Colors
	17106 (Plastic) or 17126 (Rubber) - 6 Ft.
	17109 (Plastic) or 17129 (Rubber) - 9 Ft.
Power Cord (Interlock Type)	Use BELDEN No. 8874 (Rubber) or 8896 (Plastic)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401 or 8421
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor-Unshielded)
	8429 (Two Conductor-Shielded)
	8419 (Three Conductor-Shielded)